

R E M A R K S

Reconsideration of this application, as amended, is respectfully requested.

THE CLAIMS

Claim 13 has been amended to recite features previously set forth in (now canceled) claims 21 and 30. It is respectfully submitted, therefore, that no new issues have been raised which require further consideration on the merits and/or a new search. Accordingly, it is respectfully requested that the amendments to claim 13 be approved and entered under 37 CFR 1.116. In addition, claim 31 has been canceled, without prejudice.

THE PRIOR ART REJECTION

Claims 13, 21, 25 and 29-31 were rejected under 35 USC 103 as being obvious in view of the combination of JP 63-22499 and USP 5,201,235 ("Sutton"), and claims 13, 21, 25 and 29-31 were also rejected under 35 USC 103 as being obvious in view of the combination of JP 63-22499 or JP 06-293498 in view of USP 3,321,215 ("Kampert"). These rejections, however, are respectfully traversed with respect to amended claim 13 and claims 25 and 29 depending therefrom.

According to the present invention as recited in independent claim 13, a working machine is provided which comprises a boom having a first end attached to a structural body, an attachment

attached to a second end of the boom, a bell crank attached to a middle position of the boom in a longitudinal direction thereof, a tilt cylinder having a first end pivotally supported on the structural body and a second end pivotally supported on an upper end of the bell crank when the fork is horizontally at a ground position, a boom cylinder having a first end pivotally supported on the structural body and a second end pivotally supported on the boom, and a connecting link for connecting a lower end of the bell crank and the attachment when the attachment is horizontally at a ground position.

In addition, as recited in independent claim 13, the attachments include a bucket, the bucket being attached to the boom and the connecting link such that it has different postures at the ground position including a horizontally supported posture and a tilted posture in which it is tilted by the tilt cylinder. Still further, as recited in independent claim 13, a pivot position of the tilt cylinder to the structural body is below a pivot position of the boom to the structural body, and a pivot position of the boom cylinder to the structural body is above a pivot position of the boom to the bell crank when the fork is horizontally at a ground position.

Yet still further, according to the present invention as recited in independent claim 13, the bell crank is constructed and connected to the tilt cylinder and the boom, the tilt

cylinder is constructed and connected to the bell crank and the structural body, and the boom is constructed and connected to the bell crank and the structural body to provide the attachment with the ground position, a top position and at least one intermediate position between the ground position and the top position in which the attachment, including the bucket with the different postures at the ground position, has the same posture in all of the ground position, the at least one intermediate position and the top position.

In addition, as now recited in amended independent claim 13, the angle between the first line segment and the second line segment is set at an angle at which a sum of the attachment angle of the attachment at the at least one intermediate position and at the top position becomes substantially zero.

Still further, as now recited in amended independent claim 13, the bell crank is constructed and connected to the tilt cylinder and the boom, the tilt cylinder is constructed and connected to the bell crank and the structural body, and the boom is constructed and connected to the bell crank and the structural body such that the pivot position of the tilt cylinder to the bell crank is maintained radially outward of the pivot position of the boom to the bell crank at all of the ground position, the at least one intermediate position and the top position while the attachment has the same posture. This latter aspect is shown in

the attached annotated Fig. 3, wherein a locus A (a locus of the pivot position of the tilt cylinder to the bell crank) is set radially outward of a locus B (a locus of the pivot position of the boom to the bell crank).

With the structure of the present invention as recited in amended independent claim 13, regardless of the attachment that is attached to the boom, the attachment can be kept at the same posture anywhere within a full operating range of the working machine, from the ground position to the top position, irrespective of the posture of the attachment at the ground position (i.e., at a horizontal posture or a tilted posture), thereby improving angle characteristics. In addition, even when different attachments are used, a large tilting force is obtained that, for example, allows the use of a fork as an attachment rather than a bucket.

It is respectfully submitted that the claimed present invention provides unexpected advantageous effects due to the specific connections between the different elements as precisely recited in amended independent claim 13. And it is respectfully submitted that none of the cited references even remotely suggests the need to address a problem with a tilting force for an attachment in a specific posture and in a specific position. Accordingly, it is respectfully submitted that there would have been no motivation for one of ordinary skill in the art to

combine the references in the manner suggested by the Examiner to achieve the structure and advantageous effects of the claimed present invention.

As shown in Fig. 1 of JP 63-22499, a locus of the pivot position of the tilt cylinder 9 to the tilt arm 7 (corresponding to the bell crank of the present invention) is inside or radially inward of the locus of the pivot position of the arm 4 (corresponding to the boom of the present invention) to the tilt arm 7 when the attachment is at the top position. The pivot point of the tilt cylinder 9 on the tilt arm 7 appears to be radially outward of the pivot point of the tilt arm 7 on the arm 4 when the attachment, a fork, is at the ground position, but then crosses over to be radially inward of the pivot point of the tilt arm 7 on the arm 4 when the fork is at the top position. The alternative relative arrangements of the pivot point of the pivot cylinder 9 on the tilt arm 7, either outward of or inward of the pivot point of the tilt arm 7 on the arm 4, results in considerable disadvantages during use of, for example, a bucket, when used in the top position. Specifically, it would be difficult to effectively use a bucket to transfer dirt and the like therefrom to a dump truck when the bucket is at the top position in view of the inward position of the pivot point of the tilt cylinder 9 on the tilt arm relative to the pivot point of the tilt arm 7 on the arm 4.

JP '499 therefore clearly differs from the structure of the claimed present invention whereby the pivot position of the tilt cylinder to the bell crank is maintained radially outward of the pivot position of the boom to the bell crank at all of the ground position, the at least one intermediate position and the top position while the attachment has the same posture.

In Sutton, when the bucket 14 is at the top position, the locus of the pivot position of the equalizer bar 54 (corresponding to the tilt cylinder of the present invention) to the equalizer link 40 (corresponding to the bell crank of the present invention) is radially inward of the locus of the pivot position of the lift arm 24 (corresponding to the boom of the present invention) to the equalizer link 40.

Sutton is therefore similar to JP '499 in failing to disclose or suggest maintaining the pivot position of the tilt cylinder to the bell crank radially outward of the pivot position of the boom to the bell crank at all of the ground position, the at least one intermediate position and the top position while the attachment has the same posture, as according to the present invention as recited in amended independent claim 13.

In addition, it is respectfully submitted that it would not have been obvious to modify JP '499 in view of Sutton to achieve the structure of the claimed present invention because both JP '499 and Sutton fail to disclose that a pivot position of a

tilt cylinder to a bell crank is maintained radially outward of a pivot position of a boom to the bell crank at all of a ground position, a top position and at least one intermediate position while the attachment has the same posture.

JP '498, moreover, is similar to JP '499 in that it also shows a locus F2 of the pivot position of the tilt cylinder 6 to the tilt arm 4 (corresponding to the bell crank of the present invention) being inside or radially inward of the locus C2 of the pivot position of the arm 2 (corresponding to the boom of the present invention) to the tilt arm 4 when the attachment is at the top position (see Fig. 1). In JP '498, the pivot point F of the tilt cylinder 6 on the tilt arm 4 might be radially outward of the pivot point C of the tilt arm 4 on the arm 2 when the attachment is at the ground position but, if so, it crosses over to be radially inward of the pivot point of the tilt arm 4 on the arm 2 when the fork is at the top position (see pivot points F2 and C2 in Fig. 1). Thus, in JP '498, the arrangement of the pivot point of the pivot cylinder 6 on the tilt arm 4 inward of the pivot point of the tilt arm 4 on the arm 2 when the arm is at the top position results in considerable disadvantages during use, in the same manner described hereinabove with respect to JP '499.

In Kampert, the locus of the pivot position of the ram 36 (corresponding to the tilt cylinder of the present invention) to the rocker arm linkage 32 (corresponding to the bell crank of the

present invention) is inside or radially inward of the locus of the boom arm 26 to the rocker arm linkage 32.

Kampert is therefore similar to JP '498 and JP '499 in failing to disclose maintaining the pivot position of the tilt cylinder to the bell crank radially outward of the pivot position of the boom to the bell crank at all of the ground position, the at least one intermediate position and the top position while the attachment has the same posture.

Accordingly, it respectfully submitted that it would also have not have been obvious to modify JP '499 or JP '498 in view of Kampert to achieve the structure of the claimed present invention because JP '499, JP '498 and Kampert all fail to disclose or suggest that a pivot position of a tilt cylinder to a bell crank is maintained radially outward of a pivot position of a boom to the bell crank at all of a ground position, a top position and at least one intermediate position while the attachment has the same posture, as according to the present invention as recited in amended independent claim 13.

In view of the foregoing, it is respectfully submitted that the present invention as recited in amended independent claim 13, and claims 25 and 29 depending therefrom, clearly patentably distinguishes over the cited references taken in combination under 35 USC 103.

Entry of this Amendment, allowance of the claims, and the passing of this application to issue are respectfully solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,

/Douglas Holtz/

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